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The effect of earnings quality and country-level institutions on the value relevance of earnings

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1 Introduction

A large body of prior research documents that the association between stock returns and accounting earnings (i.e., value relevance of earnings) differs across countries.[1] Those studies imply two explanations for international differences in the returns-earnings association. The first implication is that earnings quality (i.e., the quality of earnings in reflecting information about future benefits) varies across countries, thus resulting in differences in the value relevance of earnings. The second is that the ability of stock prices to impound information also differs internationally. Accounting earnings are a subset of this information, and hence the ability of stock prices to impound accounting earnings may also differ internationally, even when we control for the quality of earnings.

Consistent with the first argument, Leuz et al. (2003) and Wysocki (2005) find that earnings quality is higher in countries with higher investor rights' protection, suggesting that the returns-earnings association should be higher in those countries as well. However, the second issue has not been widely addressed in the accounting literature, but this issue is salient as accounting researchers generally assume that stock prices are equally informative across countries when they investigate the returns-earnings association on an international basis (e.g., Bushman and Piotroski 2006). Recently, a short-window study by DeFond et al. (2007) documents that the information content of

[1] See, e.g., Alford et al. (1993); Ali and Hwang (2000); Ball et al. (2000); Hung (2001); Fan and Wong (2002); Land and Lang (2002); Ball et al. (2003); Bushman and Piotroski (2006).

earnings announcements is greater in countries with higher earnings quality and stronger investor protection. Our study complements theirs by measuring earnings quality at the firm level (they use a country-level measure of earnings quality), having a different orientation to issues of investor protection (property rights protection, rather than insider trading prohibitions), and providing evidence that the price formation process is affected by investor protection where earnings quality is controlled for. That is, we are interested in the interaction between earnings quality and investor protection, where the returns-earnings association is the dependent variable.

Several recent finance studies show that market-wide variability in returns explains different proportions of firm-wide total variability, and this variability seems to be related to country-wide institutional features associated with investor protection (Morck et al. 2000; Bris et al. 2003; Ashbaugh-Skaife et al. 2005). Using this research as a basis, this study examines whether accounting information is impounded into stock prices differently across countries.

Classical valuation theory shows that stock price equals the present value of expected future cash flows (Miller and Modigliani 1961). Consistent with the theory, Kormendi and Lipe (1987) document that the returns-earnings association depends on earnings persistence, which in turn measures the extent to which current earnings are related to future earnings. Their findings suggest that the returns-earnings association is associated with the quality of earnings, i.e., the ability of earnings to reflect information about future benefits accruing to shareholders. In this paper, we use two traditional earnings quality measures: earnings persistence and the relationship between earnings and

future cash flows from operations (hereafter described as the earnings-future cash flows relation, Wysocki (2005)).

On the other hand, the returns-earnings association also depends on how stock prices reflect future cash flows. If stock prices poorly incorporate the information about future benefits, the returns-earnings association would be weaker even if earnings reflect future benefits. Thus, the returns-earnings association is related not only to the quality of earnings but also to the quality of stock prices, i.e., the ability of stock prices to incorporate the information about future benefits. Where stock prices are able to reflect future benefits, the relation between the returns-earnings association and earnings quality would be more positive. Hence, the strength of the relation between the returns-earnings association and earnings quality depends on the ability of prices to reflect that quality, and this in turn depends on the level of protection given to investors to trade on that (earnings) information. That is, different countries may reflect the same levels of earnings quality but they will not necessarily reflect similar value relevance metrics if investor protection differs across those countries.

Building on recent international finance studies, we contend that stock prices' ability to impound accounting information is related to a country's institutional infrastructure. In particular, we are interested in the protection of investor rights and the nature of the information environment. Using time-series data for firms in 13 countries from Compustat Global Industrial/Commercial file over the period 1993-2003, we find that the returns-earnings association is more positively associated with earnings quality

for countries with high anti-director rights[2] or strong legal enforcement than for countries with low anti-director rights or weak legal enforcement. Likewise, we find that the returns-earnings association is more positively associated with our measures of earnings quality when a country's financial disclosure system is timely or when more analysts follow a stock in that country. Our findings suggest that higher earnings quality information has a stronger association with value relevance when investor protection is higher and where information opaqueness is lower. Within-country analyses corroborate our cross-country results. We also document that the association between stock returns and earnings quality is higher in the United States than in other countries. Overall, our findings are consistent with the notion that the returns-earnings association reflects not only the quality of earnings but also the quality of stock prices.

This study contributes to the literature in the following ways. First, our study extends a line of research on the value relevance of earnings across countries. Prior research implies two explanations for the international difference in the returns-earnings association: (1) that earnings quality is different across countries, and (2) that the ability of stock prices to impound accounting information is different across countries. The findings of several studies are consistent with the first explanation (e.g., Leuz et al. 2003; Bhattacharya et al. 2003; Wysocki 2005; DeFond et al. 2007). However, we provide evidence on the second issue and investigate whether stock prices impound earnings differently across countries even if the quality of earnings is controlled for. Furthermore, unlike recent studies (e.g., Leuz et al. 2003; DeFond et al. 2007), we

[2] We use the shareholder protection index from La Porta et al. (1998).

measure earnings quality at the firm level rather than the country level. In these ways, our study complements the existing international earnings quality literature. Our results have implications for international harmonization. They illustrate that adopting common accounting standards (which may lead to similar measures of earnings quality) will not be adequate to ensure that the same information is represented in share prices.

Second, the study adds to a growing literature on international differences in the information content of stock prices. Prior research finds that stock prices impound firm-specific information differently across countries because of differences in investor rights protection, the openness of capital markets, and information environment opaqueness (e.g., Morck et al. 2000; Li et al. 2004; Jin and Myers 2006). These studies do not examine whether stock prices impound accounting information (like earnings) in the same way in different countries. Chan and Hameed (2006) do examine this issue, but in the context of emerging markets and analysts' earnings forecasts. Their study focuses on the role of analysts in emerging markets, and it includes an analysis of the impact of earnings forecasts on returns on portfolios, with the portfolios conditioned on whether analyst following is high or low. In contrast to prior research, we use the association between the returns-earnings association metric and earnings quality to measure how well stock prices can capitalize the fundamentals reflected in earnings. We provide evidence on how the returns-earnings association can vary with country-level institutional factors. In our approach, we acknowledge the primacy of investor protection, which can affect both the quality of earnings and the quality of prices through its impact on how and whether informed traders trade.

Third, this study also adds to the stream of international accounting studies in terms of methodology. Prior research usually conducts cross-sectional or country-level analyses ignoring the issue of innate factors (Francis et al. 2005). Innate factors are particularly important in an international context because the make-up of firms within a national economy is likely to differ widely between countries. If these fundamental differences are not controlled for, omitted variables are likely to be a serious issue. We control for five innate factors identified by Francis et al. (2005) in conducting our firm-level tests across countries.

The rest of the paper is organized as follows. Section 2 reviews prior research. Section 3 develops the hypotheses. We describe the sample and research design in Section 4. Empirical results are presented in Section 5. Section 6 conducts additional analysis. Section 7 concludes.

2 Literature Review

2.1 Value relevance of earnings across countries

Alford et al. (1993) find that the information content of earnings is different across seventeen countries. Earnings are more informative in Australia, France, the Netherlands, and the UK than in the US, whereas Denmark, Germany, Italy, Singapore, and Sweden have less informative earnings than the US. However, the results for the other eight countries are inconclusive.[3] They argue that the difference in value relevance of earnings is due to the capital market differences including the financial reporting requirements,

[3] The other eight countries are Belgium, Canada, Hong Kong, Ireland, Japan, Norway, South Africa, and Switzerland.

disclosure practices, government regulation, and corporate governance. Ali and Huang (2000) investigate the relation between country-specific factors and value relevance. They find that value relevance is lower for countries with bank-oriented financial systems because of lower demand for value-relevant financial reports, and is lower in countries where private-sector bodies are not involved in the standard setting process because the intentions of government standard setters are likely to be politically motivated. They also find that value relevance is lower for continental model countries, for countries where tax rules significantly influence financial accounting measurements, and for countries where less is spent on external auditing services.

Ball et al. (2000) find that earnings are more timely in common law countries than in code law countries. Their findings are consistent with the notion that common law countries have a higher demand for timely public disclosure to mitigate information asymmetry that is more severe in common law countries. Hung (2001) finds that the value relevance of earnings is higher for countries with accounting systems that use accruals more extensively and countries with strong protection of investor rights, suggesting that strong investor rights protection can enhance the benefits of accrual accounting by constraining opportunism.

Fan and Wong (2002) document that the value relevance of earnings is negatively associated with ownership concentration in seven East Asian countries.[4] They provide two complementary explanations for their findings. First, the entrenchment effect of ownership concentration reduces the credibility of reported earnings and consequently

[4] The seven countries are Hong Kong, Indonesia, Malaysia, Singapore, South Korea, Taiwan and Thailand.

reduces their information content. Second, high ownership concentration also hinders information flows to the public resulting in low earnings informativeness. Ball et al. (2003) find that the four East Asian common law countries – Hong Kong, Malaysia, Singapore and Thailand – have less timely earnings than other common law countries suggesting that poor incentives of managers and auditors reduce the quality of earnings even though the four countries have (so-called) high quality accounting standards. Bushman and Piotroski (2006) find that accounting conservatism across countries is affected by legal and political institutions.

DeFond et al. (2007) adopt a short-window approach, and examine the reaction of share prices (measured by a scaled squared residual) of firms across different countries, where the primary experimental variables are country-level measures of earnings quality and investor protection. They find that earnings announcements are more informative when countries have higher earnings quality and stronger investor protection. The investor protection metric uses insider trading provisions, arguing that strong provisions will lead to an increased earnings announcement effect.

In summary, prior studies find that the value relevance of earnings is different across countries. Those studies imply two explanations for the international differences in value relevance. First, the lower value relevance of earnings may be related to the lower quality of earnings in some countries. Second, the lower value relevance of earnings may be related to the lower ability of stock prices to impound accounting information in some countries even if the accounting quality is high. Findings in several studies are consistent with the first explanation. For example, Leuz et al. (2003) and

Wysocki (2005) find that earnings quality is lower in countries with lower investor rights protection, where earnings value relevance could be lower. Bhattacharya et al. (2003) find that earnings opacity is associated with two characteristics of a country's equity market – the return that the shareholders demand and how much they trade – implying that earnings quality could affect the value relevance of earnings.

In contrast to those studies, our study attempts to provide more explicit evidence on the second explanation, i.e., we examine whether the value relevance of earnings is associated with the ability of stock prices to impound (accounting) information across countries. This study complements DeFond et al. (2007) in the following ways. First, we use firm-level earnings quality metrics whereas DeFond et al. (2007) use a country-level measure of earnings quality. Second, we provide long-window evidence in contrast to their use of short (two-day) windows. Third, conceptually, our tests have a different orientation than theirs. DeFond et al. (2007) argue that weak insider trading legislation will lead to a smaller share price reaction around the earnings announcement as it is more likely that the information will have been the basis for trades before the information is released. Our orientation is that in weak investor protection environments, it is less likely that the information will be the basis for trading as investors' property rights are less well protected.

2.2 Information content of stock prices across countries

Morck et al. (2000) find that stock prices in low-income countries impound firm-specific fundamentals less fully than in high-income countries. Furthermore, they document evidence that stock price synchronicity is negatively associated with the protection of

investor rights.[5] They conclude that higher protection of investor rights in developed economies promotes informed trading, resulting in more informative stock prices. Where property rights are weak, informed trading is less and this reduces the probability that firm-specific information, including accounting information, will be impounded into share prices. Wurgler (2000) suggests that lower stock price synchronicity in large capital markets could be due to more effective arbitrage facilitated by liquidity and low transaction costs. Bris et al. (2003) find that stock prices incorporate information faster in countries where short sales are allowed and practiced. Li et al. (2004) document evidence that firm-specific information is impounded more fully into stock prices in emerging markets with higher capital market openness than in emerging markets with lower capital market openness.[6] Furthermore, the negative association between stock price synchronicity and capital market openness is magnified by country-level institutions. They find that firm-specific stock return variation is significantly related to the interaction term of capital market openness and a good government index.

Jin and Myers (2006) develop a theoretical model to explain why stock prices impound firm-specific information less fully in countries with less developed financial systems and poorer corporate governance. They show that information opaqueness (i.e., lack of transparency) reduces the amount of firm-specific risk absorbed by outside

[5] They use the R-square from the market model as a measure of stock price synchronicity, and use alternative proxies for the protection of investor rights: (1) a good government index based on the sum of three country indexes: (i) corruption index, (ii) risk of expropriation index, (iii) repudiation of contracts by government index; (2) rule of law index; (3) judicial efficiency index; and (4) the origin of legal systems, all from La Porta et al. (1998).

[6] They use the capital market openness measure provided by Edison and Warnock (2002).

investors, resulting in higher stock price synchronicity.[7] Ashbaugh-Skaife et al. (2005) extend that literature by developing an alternative measure of firm-specific information based on the percentage of zero return weeks. They find that their zero-return metric is better than the R-square from asset pricing regressions as a measure of the firm-specific information impounded in stock prices internationally. Chan and Hameed (2006) examine stock price synchronicity and analyst coverage in 25 emerging markets. They find that securities that are covered by more analysts have higher synchronicity, suggesting that the role of analysts is to determine how a company covaries with the market, rather than what is "special" about that company. Their countries would generally be classified as those where investor protection is low.

Overall, prior research finds that stock prices are more informative in countries with higher protection of investor rights, higher openness of capital markets, and less opaque information environments. However, those studies do not explore how stock prices impound accounting information across countries. Our study attempts to complement this line of research by incorporating earnings quality.

3 Hypothesis Development

3.1 Investor rights protection

When countries have lower protection of investor rights, governments and politicians can make use of various tactics such as changing legislation, licensing requirements,

[7] They use five opaqueness measures: (1) a survey-based measure from the Global Competitiveness Report, (2) a measure of auditing activity from Bhattacharya et al. (2003), (3) a measure of how many key accounting variables are included in financial statements from La Porta et al. (1998), (4) an opaqueness measure from PricewaterhouseCoopers, and (5) an opaqueness measure based on the diversity of analysts' forecasts.

repudiation of commitments, and nationalization to divert wealth to an entrenched elite (Morck et al. 2000). In such countries, political events or rumors could lead to larger market-wide stock price swings, resulting in higher stock price synchronicity. Lower protection of investor rights discourages informed risk arbitrage because government interventions and political uncertainty may reduce the benefits of seeking fundamental information and trading on that. Finance theory shows that informed trading increases in the attractiveness of risk arbitrage (e.g., Grossman 1976; Shleifer and Vishny 1997). In other words, firm-specific information is less useful to arbitrageurs if protection of investor rights is poor, and that decreases the number of informed traders relative to noise traders.

Morck et al. (2000) find that stock prices impound less firm-specific information in countries with lower protection of investor rights. In those countries, stock prices may not fully impound information about future benefits of the firm. If stock prices do impound information about a firm's fundamentals, the association of stock prices with earnings would be positively related to the quality of earnings because high quality earnings better reflect the firm's future benefits. Thus, the association between the returns-earnings association and earnings quality gauges the ability of stock prices to capture the information about future benefits as reflected in accounting earnings. For countries with lower investor rights protection, stock prices may have less ability to impound accounting information even if the quality of that information is high. Hence, the association between the returns-earnings association and earnings quality would be

less positive when countries have low investor rights protection. We develop the first hypothesis as follows:

H1 *The returns-earnings association is more positively associated with earnings quality as investor rights across countries increases.*

3.2 Information environment opaqueness

Jin and Myers (2006) theoretically show that less developed financial systems and poorer corporate governance reduce the amount of firm-specific risk absorbed by outside investors, resulting in higher stock price synchronicity. They document evidence that stock prices impound less firm-specific information in countries with high information opaqueness. The more opaque the information environment, the greater the amount of bad news that insiders hide. The credibility of all information, including accounting information, is lower in an information environment that lacks transparency. If the information environment is highly transparent, better information would flow to the public. Analysts are more effective intermediaries – i.e., they are better able to interpret accounting information – when the information environment is less opaque (Lang and Lundholm 1996).

As stock prices impound more firm-specific information in countries with lower opaqueness, information about future benefits will be better reflected in stock prices. In those countries, stock prices are more likely to reflect the same information set as earnings do when earnings quality is high. When countries have highly opaque information environments, stock prices do not reflect information about future benefits as

well, resulting in a lower returns-earnings association even if earnings quality is high. Thus, the association between the returns-earnings association and earnings quality would be less positive in countries with more opaque information environments. We formulate the second hypothesis as follows:

H2 *The returns-earnings association is more positively associated with earnings quality for countries with lower information opaqueness.*

4 Research Design

4.1 Data

We select all firm-year observations from the Compustat Global Industrial/Commercial file over the period 1993 to 2003. Then, we identify firms that have a time-series of data of at least seven years so we can calculate a firm-specific measure of earnings quality. We also use the stock price data from the Compustat Global Issue file. After excluding observations for countries with less than 30 firms, Table 1 presents the numbers and frequencies of firms in our sample across 13 countries. 4,238 firms come from thirteen countries with at least 30 firms in our sample (number of firms in parentheses): Australia (105), Canada (224), Germany (64), Denmark (31), France (82), United Kingdom (463), Hong Kong (95), Japan (967), Malaysia (166), Netherlands (43), Singapore (102), Thailand (82), and United States (1,814).

Insert Table 1 about here

4.2 Variables

We measure the firm-specific returns-earnings association by estimating the following firm-specific regression and using the coefficient on the earnings change as a measure of the contemporaneous relation between stock returns and accounting earnings:

$$RET_{j,t} = \beta_{0,j} + \beta_{1,j}\, \Delta EARN_{j,t} + \varepsilon_{j,t} \quad (1)$$

where

$RET_{j,t}$ = firm j's 12-month return ending three months after the end of fiscal year t;

$\Delta EARN_{j,t}$ = change in firm j's income before extraordinary items in year t, scaled by market value at the end of year t-1.

We label the coefficient for returns-earnings association $\beta_{1,j}$ as REA. Similar to Tucker and Zarowin (2006), we use the fractional ranking of REA within each country in the analysis to control for country fixed effects.[8] We use a long window in measuring the returns-earnings association because accounting information can be publicly released through earnings announcements, but can also be disseminated, interpreted, and processed through other information sources including analyst reports and media coverage. Thus, the emphasis is on the association between stock returns and the change in accounting earnings over a long window rather than the response to unexpected earnings over a short window (i.e., the earnings response coefficient).

Following Leuz et al. (2003), we use the anti-director rights score from La Porta, Lopez-de-Silanes et al. (1998) as our first measure of investor rights' protection (INVRA), and use the average score of three legal enforcement scores in La Porta et al.

[8] The fractional ranking for a firm is the raw rank of the firm divided by the total number of firms within a country to which the firm belongs.

(1998): (1) efficiency of the judicial system, (2) rule of law, and (3) corruption, as the second measure of investor rights' protection (INVRL). In terms of measuring information opaqueness, we use a Centre for International Financial Analysis and Research (CIFAR) based score on timeliness of financial disclosure from Bushman et al. (2004) as a first measure (INFOPT). We use this CIFAR based score on timeliness of financial disclosure because Jin and Myers (2006) argue that information opaqueness could be related to the delay of bad news disclosure by companies. We also use the number of analysts across countries from Chang et al. (2000) as a second measure of information opaqueness (INFOPA). Lang and Lundholm (1996) show that analyst following is related to the information environment so we use analyst coverage in a country as a proxy for its information opaqueness.

Table 2 summarizes the scores of investor rights protection measures and information opaqueness measures across the 13 countries.

Insert Table 2 about here

To measure earnings quality, we run the first order auto-regression of earnings:

$$E_{j,t} = \rho_{0,j} + \rho_{1,j} E_{j,t-1} + \upsilon_{j,t} \quad (2)$$

where

$E_{j,t}$ = firm j's split-adjusted EPS, income before extraordinary items in year t, divided by average number of outstanding shares between the beginning and end of year t.

Based on Kormendi and Lipe (1987) and Francis et al. (2004), we use the coefficient $\rho_{1,j}$ in eq. (2), earnings persistence, as the first measure of earnings quality: QPER. This

coefficient measures the ability of current earnings to reflect information about future earnings. We use the fractional ranking of QPER within each country in the analysis.

Prior research documents a relationship between earnings and future cash flows (e.g., Bowen et al. 1996; Barth et al. 2001). We therefore also run the following regression:

$$CFO_{j,t} = \delta_{0,j} + \delta_{1,j} E_{j,t-1} + \zeta_{j,t} \quad (3)$$

where

$CFO_{j,t}$ = firm j's cash flows from operations in year t, divided by average number of outstanding shares between the beginning and end of year t.

We use the coefficient $\delta_{1,j}$ in eq. (3), the earnings-future cash flows relation, as the second measure of earnings quality: QCFO. This coefficient measures the ability of earnings to reflect information about future cash flows from operations. We also use the fractional ranking of QCFO within each country in the analysis.[9]

Finally, we use the five innate factors in Francis et al. (2004) as control variables. These variables are firm size, cash flow variability, sales variability, operating cycle, and incidence of negative earnings realizations. Firm size (SIZE) is measured by the log of total assets ($m). Cash flow variability (CFOV) is the standard deviation of the firm's time-series cash flows from operations, scaled by total assets. Sales variability (SALEV) is the standard deviation of the firm's time-series sales revenues, scaled by total assets. Operating cycle (OPCYC) is calculated as the log of the sum of the firm's days accounts

[9] We use at least 7 years of time-series data to run regression (1), (2) and (3) for each firm. Following Ball et al. (2000), the top and bottom percentiles of each variable in these equations are excluded.

receivable and days inventory. Incidence of negative earnings realizations (NEGE) is the firm's proportion of losses over the time-series period.

4.3 Models

We use the following cross-sectional model to test H1:

$$REA_j = \mu_0 + \mu_1 INVR_j + \mu_2 QE_j + \mu_3 INVR_j * QE_j + \mu_4 SIZE_j + \mu_5 CFOV_j + \mu_6 SALEV_j + \mu_7 OPCYC_j + \mu_8 NEGE_j + \mu_9 INFOP_j + \omega_j \quad (4)$$

where

$INVR_j$ = measures of investor rights protection for a country to which firm j belongs, either anti-director rights (INVRA) or legal enforcement (INVRL);

QE_j = measures of earnings quality of firm j in year t, either earnings persistence (QPER) or earnings-future cash flows relation (QCFO);

$INFOP_j$ = measures of information opaqueness for a country to which firm j belongs, either timeliness of financial disclosure (INFOPT) or analyst coverage (INFOPA) is used.

Support for H1 exists if μ_3 is positive and significantly different from zero. The sign of μ_1 depends on not only the relationship between the returns-earnings association and investor rights protection but also the level of earnings quality. Similarly, the sign of μ_2 depends on not only the relationship between the returns-earnings association and earnings quality but also the level of investor rights protection. Thus, we do not predict signs for either of μ_1 and μ_2. Based on Francis et al. (2004), the predicted signs of the coefficients on the five innate control variables are as follows: $\mu_4 < 0$, $\mu_5 > 0$, $\mu_6 > 0$, $\mu_7 < 0$,

and $\mu_8 < 0$.[10] Further, we control for information opaqueness in testing H1, but we do not predict a sign for μ_9.[11]

We test H2 by running the following cross-sectional model:

$$REA_j = \pi_0 + \pi_1 INFOP_j + \pi_2 QE_j + \pi_3 INFOP_j * QE_j + \pi_4 SIZE_j + \pi_5 CFOV_j + \pi_6 SALEV_j + \pi_7 OPCYC_j + \pi_8 NEGE_j + \pi_9 INVR_j + \psi_j . \quad (5)$$

If H2 is supported, π_3 will be significantly different from zero and positive. Similar to eq. (4), the predicted signs of other coefficients in eq. (5) are as follows: no predicted signs for π_1 and π_2, $\pi_4 < 0$, $\pi_5 > 0$, $\pi_6 > 0$, $\pi_7 < 0$, and $\pi_8 < 0$. As in H1, we control for investor protection in testing H2, but we do not predict a sign for π_9.

5 Empirical Results

The descriptive statistics of the variables are reported in Table 3. By using the fractional ranking scores, the mean and median of the returns-earnings association (REA), earnings persistence (QPER), and the earnings-future cash flows relation (QCFO) are all 0.50. Table 4 presents Pearson correlations between independent variables. After measuring earnings quality by the fractional ranking, both investor rights protection and information opaqueness are not correlated with earnings quality measures. The correlation coefficients are 0.52, 0.59, 0.44, 0.44, 0.41, and 0.44 for each pair of country-level factors: anti-director rights and legal enforcement, anti-director rights and timeliness of financial disclosure, anti-director rights and analyst coverage, legal enforcement and timeliness of financial disclosure, legal enforcement and analyst coverage, and timeliness

[10] The control variables in the regressions are winsorized at 1 and 99 percent.

[11] We do not test H1 and H2 together because the interaction terms, i.e., INVR*QE and INFOP*QE, are highly correlated (r = 0.875 - 0.979).

of financial disclosure and analyst coverage, respectively, showing that the four country-level variables are correlated.

Insert Tables 3 and 4 about here

We conduct a preliminary within-country analysis for each of the 13 countries in the sample. We run the following regression for each country:

$$REA_j = \lambda_0 + \lambda_1 QE_j + \lambda_2 SIZE_j + \lambda_3 CFOV_j + \lambda_4 SALEV_j + \lambda_5 OPCYC_j + \lambda_6 NEGE_j + \theta_j . \quad (6)$$

The coefficient λ_1 measures the country-level association between the returns-earnings association and earnings quality. We compute the composite score of investor protection and information opaqueness as the factor score based on the first factor from a factor analysis of anti-director rights, legal enforcement, timeliness of financial disclosure, and analyst coverage. Table 5 provides the composite scores, standardized coefficients λ_1, their corresponding t-statistics, and p-values for each country.

Insert Table 5 about here

To see if the pattern in Table 5 corresponds with our hypotheses, we calculate the parametric and nonparametric correlations between our composite score and the standardised coefficients λ_1 or their corresponding t-statistics. We find that Pearson correlation coefficients for the correlation between the composite score and λ_{1QPER} and λ_{1QCFO} are 0.891 and 0.810, respectively, and these correlations are significant at the 1% level. Further, the Pearson coefficients for the correlations between the composite score and t-statistics for λ_{1QPER} and λ_{1QCFO} are 0.692 and 0.676, respectively, and these are significant at the 1% and 5% level, respectively. We find similar results using the

Spearman correlations. These correlations show that our overall investor rights protection and information opaqueness scores are significantly positively correlated with the country-level metrics which capture the association between earnings quality and value relevance. Thus, our within-country analyses support our hypotheses.

Next, we conduct cross-country tests by pooling data from all 13 countries. Table 6 presents evidence on testing whether the association between the returns-earnings association and earnings quality is related to a country's investor rights protection where we control for INFOPT. Untabulated results where we control for INFOPA are qualitatively the same. Columns 3 and 4 of Table 6 report the results on the effect of anti-director rights (INVRA) on the relation between the returns-earnings association and earnings persistence (QPER). The coefficient on the interaction term (INVRA*QPER) is 0.052 and is statistically significantly different from zero (t-statistic = 2.98, p-value < 0.01), consistent with H1. The results show that the returns-earnings association is more positively associated with earnings persistence as anti-director rights increase, which we interpret as higher investor protection. Consistent with findings by Francis et al. (2004), we also find that two innate variables, firm size (SIZE) and incidence of negative earnings realization (NEGE) are negatively associated with the returns-earnings association. In addition, we find that cash flow variability (CFOV) and operating cycle (OPCYC) are negatively and positively associated with the returns-earnings association, respectively.

Insert Table 6 about here

Columns 5 and 6 of Table 6 present evidence on whether legal enforcement (INVRL) affects the relation between the returns-earnings association and earnings

persistence. We find that the coefficient on the interaction term (INVRL*QPER) is 0.044 and significantly different from zero (t-statistic = 2.22, p-value < 0.05), supporting H1. The results show that the returns-earnings association is more positively related to earnings persistence as legal enforcement increases across countries.

Columns 7 and 8 of Table 6 report the results on the effect of anti-director rights on the association between the returns-earnings association and the earnings-future cash flows relation (QCFO). The coefficient on the interaction term (INVRA*QCFO) is 0.075 and significantly different from zero (t-statistic = 4.20; p-value < 0.01), consistent with H1. The results show that the returns-earnings association is more positively associated with the earnings-future cash flows relation when a country has higher anti-director rights. Columns 9 and 10 of Table 6 document evidence on testing whether legal enforcement affects the association between the returns-earnings association and the earnings-future cash flows relation. The coefficient on the interaction term (INVRL*QCFO) is 0.014 and is not significant (t-statistic = 0.63), inconsistent with H1. Overall, the results in Table 6 support H1 that the association between the returns-earnings association and earnings quality increases as investor protection increases across countries. That is, the value relevance of earnings depends on the quality of earnings, and the ability of prices to reflect that quality.

Table 7 provides evidence on examining whether the association between the returns-earnings association and earnings quality is associated with the information environment of a country where we control for INVRA. Untabulated results where we control for INVRL are qualitatively the same. The results on the effect of timeliness of

financial disclosure (INFOPT) on the relation between the returns-earnings association and earnings persistence are reported in Columns 3 and 4. We find that the coefficient on the interaction term (INFOPT*QPER) is 0.008 and significantly different from zero (t-statistic=5.20, p-value<0.01), consistent with H2. The results show that the returns-earnings association is more positively associated with earnings persistence when timeliness of financial disclosure is high. Columns 5 and 6 of Table 7 present the evidence on whether analyst coverage (INFOPA) affects the relation between the returns-earnings association and earnings persistence. The coefficient on the interaction term (INFOPA*QPER) is 0.001 and is not significant (t-statistic = 0.26), inconsistent with H2.

Insert Table 7 about here

Columns 7 and 8 of Table 7 present evidence on the effect of timeliness of financial disclosure on the association between the returns-earnings relation and the earnings-future cash flows relation. The coefficient on the interaction term (INFOPT*QCFO) is 0.008 and significant (t-statistic = 5.10; p-value < 0.01), consistent with H2. Columns 9 and 10 provide the results from testing whether analyst coverage affects the association between the returns-earnings and the earnings-future cash flows relation. We find that the coefficient on the interaction term (INFOPA*QCFO) is 0.004 and significant (t-statistic = 1.95; p-value < 0.05), consistent with H2. Overall, the results in Table 7 are consistent with H2 that the association between the returns-earnings association and earnings quality is more positive for countries with information environments that have low opaqueness than for countries with information environments with high opaqueness. The returns-earnings association depends on both earnings quality

and the information environment. The same quality of earnings will reflect different value relevance if the information environment is different.

6 Additional Analyses

We conduct several additional analyses to examine the robustness of our results. First, earnings quality is not an exogenous variable, and our measures of earnings quality may be affected by the informativeness of earnings, i.e., the returns-earnings association. For example, when REA is high, managers have more incentive to pay attention to the quality of earnings. To control for this endogenous relationship, we follow a procedure used by Frankel et al. (2006), and we model QE as a function of the exogenous control variables and QERANK which is the portfolio rank of firm *j*'s QE:

$$QE_j = \alpha_0 + \alpha_1 SIZE_j + \alpha_2 CFOV_j + \alpha_3 SALEV_j + \alpha_4 OPCYC_j + \alpha_5 NEGE_j + \alpha_6 QERANK_j + \varepsilon_j \quad (7)$$

To create QERANK, we rank firms by QE and then divide them into three equal-sized portfolios. Firms in the lowest (highest) portfolio are coded 0 (2). Once we estimate eq. (7), we use the fitted value for QE in place of the actual value in eqs. (4) and (5).

The rationale for including QERANK is that endogeneity is likely to affect the variation in QE rather than the level of QE (e.g., Greene 2000). Thus, as Hentschel and Kothari (2001) explain, a relatively crude measure of the endogenous variable can be used as an instrumental variable since it is likely to capture the level of that variable but not the endogenously determined variations around those levels.

Table 8 summarizes the results from re-estimating eqs.(4) and (5) using the fitted values of QE. For brevity, we only report the coefficients for the interaction between the

fitted values and our measures of investor protection and information opaqueness. There are eight interaction terms, and six are significant and correctly signed. Only $INVRL_j$*$FQCFO_j$ and $INFOPA_j$*$FQPER_j$ are not significant, and the corresponding coefficients in Tables 6 and 7 (i.e., $INVRL_j$*$QCFO_j$ and $INFOPA_j$*$QPER_j$) are also not significant. Thus, after controlling for endogeneity in QE, the results in Table 8 are consistent with our earlier findings.

Insert Table 8 about here

Second, we re-estimate eqs. (4) and (5) by converting one of $INVR_j$, $INFOP_j$, $QCFO_j$, and $QPER_j$ into a dummy variable that takes the value of 1 if its value is at or above the median and 0 otherwise. We find a more positive relationship for the returns-earnings association with earnings persistence for firms in countries with high anti-director rights, legal enforcement, and timeliness of financial disclosure (non-tabulated t-statistics = 2.43, 3.21, and 4.91, respectively) when the country-level dummy variables are used. In turn, to measure earnings quality by the earnings-future cash flows relation, we find significant evidence for each country-level dummy variable (non-tabulated t-statistics = 4.53, 4.29, 4.56, and 1.41, respectively). When earnings persistence is converted into a dummy, we document significant evidence for anti-director rights, legal enforcement, and timeliness of financial disclosure (non-tabulated t-statistics = 3.13, 2.73, and 5.58, respectively). Also, we find that anti-director rights, timeliness of financial disclosure, and analyst coverage affect the association between the returns-earnings relation and the dummy of the earnings-future cash flows relation (non-tabulated t-statistics = 3.76, 3.89, and 2.28, respectively). Overall, our earlier results still hold when

we measure investor protection, information opaqueness, or earnings quality using a dummy variable.

Third, we test the hypotheses at the firm level based on the composite score of investor protection and information opaqueness in Table 5. Likewise, we find that the returns-earnings association is more positively associated with the earnings persistence and the earnings-future cash flows relation for firms in countries with high composite scores of investor protection and information opaqueness (non-tabulated t-statistics = 5.27 and 4.61, respectively).

Fourth, we examine whether the results are driven by the dominance of the number of the US firms and Japanese firms in our sample. After excluding the US firms from the sample, we find that the returns-earnings association is more positively associated with earnings persistence for firms in countries with high anti-director rights, legal enforcement, and timeliness of financial disclosure (non-tabulated t-statistics = 1.81, 1.37, 4.69, respectively). After excluding the US and Japanese firms together from the sample, we find that the returns-earnings association is more positively associated with earnings persistence for firms in countries with high anti-director rights and timeliness of financial disclosure (non-tabulated t-statistics = 1.95 and 3.79, respectively). After excluding the US firms or the US and Japanese firms together from the sample, we also document that the returns-earnings association is more positively associated with the earnings-future cash flows relation for firms in countries with high anti-director rights and timeliness of financial disclosure. In summary, we still find support for our hypotheses when US, or US and Japanese firms are omitted.

Fifth, we examine whether the association between the returns-earnings association and earnings quality is more positive in the US than in non-US countries because it is usually recognized that the US has higher investor rights protection and lower opaqueness of the information environment than other countries. We use a US dummy variable that takes a value of one for US companies and zero otherwise, and run regressions of the returns-earnings association on the interaction term of the US dummy variable and earnings quality after controlling for the innate factors. We find that the coefficients on the interaction term of the US dummy variable and earnings persistence, and the earnings-future cash flows relationship, are significantly positive (non-tabulated t-statistics = 2.51 and 3.61, respectively). Our findings suggest that US stock prices impound accounting information more precisely than non-US stock prices.

Finally, we test if the results are robust to the requirements on the length of years for data availability. We increase the minimum number of years from at least 7 years to at least 8 or at least 9 years. While this gives us more time-series data to estimate eqs. (1)-(3), it also reduces our sample size. We find similar results, that the returns-earnings association is more positively associated with earnings quality when a country has high investor rights protection or low information opaqueness when we use a minimum of 8 or 9 years of data.

7 Conclusion

This study examines whether the association between the returns-earnings association and earnings quality is related to investor rights protection and the information environment in an international setting. We find that the returns-earnings association is more positively

associated with earnings persistence and the earnings-future cash flows relation when a country has high investor rights protection, measured by anti-director rights and legal enforcement. Also, we find that the returns-earnings association is more positively associated with earnings persistence and with the earnings-future cash flows relation when a country has low information opaqueness, measured by timeliness of financial disclosure and analyst coverage. Our findings suggest that the extent of investor protection moderates the association between the returns-earnings relationship and earnings quality. In other words, price reactions depend on earnings quality and the ability of investors to be able to trade on that information. Effectively the quality of prices and the quality of earnings both affect the value relevance of earnings. Thus, this study implies that the role of accounting in capital markets depends on the institutional infrastructure of the capital markets. Even if the accounting system can generate high quality accounting information in a country with a weak institutional infrastructure, the information is still less important to capital market participants in that country. This has important implications for policy makers who emphasize the importance of international accounting standards harmonization. Without improvements in investor protection, any (arguable) gains from improved earnings quality will not be fully realized.

Similar to other studies, this study has its own limitations. First, doing firm-specific analysis requires time-series data, and this can lead to a survivorship bias. Second, we use the timeliness of financial disclosure and analyst coverage as proxies for opaqueness of information environment. However, there are no well-established paradigms that support these two measures as being the most appropriate. The

appropriateness of using these one-dimensional measures depends on how well they can represent the comprehensive features of the information environment. Future research might investigate alternative proxies for country-level information opaqueness.

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Table 1
Sample firms across countries

This table presents frequency and percent of firms with at least 7 years of data available in Compustat Global Industrial/Commercial between 1993-2003 for 13 sample countries.

Country Name	Country Code	Frequency	Percent (%)
AUSTRALIA	AUS	105	2.48
CANADA	CAN	224	5.29
GERMANY	DEU	64	1.51
DENMARK	DNK	31	0.73
FRANCE	FRA	82	1.93
UNITED KINGDOM	GBR	463	10.92
HONG KONG	HKG	95	2.24
JAPAN	JPN	967	22.82
MALAYSIA	MYS	166	3.92
NETHERLANDS	NLD	43	1.01
SINGAPORE	SGP	102	2.41
THAILAND	THA	82	1.93
UNITED STATES	USA	1,814	42.80
Total		4,238	100.00

Table 2

Scores of investor rights protection and information opaqueness across countries

This table presents country scores of investor rights protection, measured by: (1) anti-director rights (INVRA) from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998); (2) legal enforcement (INVRL) which is the average of three legal enforcement scores, i.e., (a) efficiency of judicial system, (b) rule of law, (c) corruption, from La Porta, Lopez- de-Silanes, Shleifer, and Vishny (1998), and country scores of information opaqueness, measured by (1) timeliness of financial disclosure (INFOPT), a CIFAR based score from Bushman, Piotroski, and Smith (2004); (2) analyst coverage (INFOPA), from Chang, Khanna, and Palepu (2000). Higher scores indicate higher protection of investor rights and lower opaqueness of information environment.

Country	Anti-director Rights	Legal Enforcement	Timeliness of Financial Disclosure	Analyst Coverage
AUSTRALIA	4	9.51	89.13	12.30
CANADA	5	9.75	99.28	16.90
GERMANY	1	9.05	68.12	32.40
DENMARK	2	10.00	73.91	12.87
FRANCE	3	8.68	78.26	23.20
UNITED KINGDOM	5	9.22	86.96	20.10
HONG KONG	5	8.91	69.57	25.00
JAPAN	4	9.17	86.23	14.87
MALAYSIA	4	7.72	65.22	19.90
NETHERLANDS	2	10.00	78.26	29.53
SINGAPORE	4	8.93	63.77	20.90
THAILAND	2	4.89	89.13	9.77
UNITED STATES	5	9.54	97.83	30.23

Table 3
Descriptive statistics

This table presents descriptive statistics about the following variables:

REA = fractional ranking of the returns-earnings association coefficient within a country where the returns-earnings association coefficient is estimated for each firm from the following model,

$$RET_{j,t} = \beta_{0,j} + \beta_{1,j}\, \Delta EARN_{j,t} + \varepsilon_{j,t} \quad (1)$$

SIZE = Firm size, measured by the log of total assets ($m).

CFOV = Cash flow variability, measured by the standard deviation of the firm's time-series cash flows from operations, scaled by total assets.

SALEV = Sales variability, measured by the standard deviation of the firm's time-series sales revenues, scaled by total assets.

OPCYC = Operating cycle, measured by the log of the sum of the firm's days account receivables and days inventory.

NEGE = Incidence of negative earnings realization, measured by the firm's proportion of losses over the time series period.

QPER = Earnings quality, measured by the fractional ranking of earnings persistence within a country, and earnings persistence is estimated for each firm from the following model,

$$E_{j,t} = \rho_{0,j} + \rho_{1,j}\, E_{j,t-1} + \upsilon_{j,t} \quad (2)$$

QCFO = Earnings quality, measured by the factional ranking of the relation between earnings and future cash flows from operations within a country. The relation between earnings and future cash flows from operations is estimated for each firm from the following model,

$$CFO_{j,t} = \delta_{0,j} + \delta_{1,j}\, E_{j,t-1} + \zeta_{j,t} \quad (3)$$

Variables	N	Mean	Median	Std. Dev.	Q1	Q3
REA	4,238	0.50	0.50	0.29	0.25	0.75
SIZE	4,238	6.27	6.21	1.83	5.07	7.48
CFOV	4,238	0.08	0.06	0.07	0.04	0.10
SALEV	4,238	0.19	0.14	0.17	0.08	0.25
OPCYC	4,238	4.74	4.80	0.73	4.32	5.19
NEGE	4,238	0.23	0.14	0.27	0.00	0.38
QPER	4,238	0.50	0.50	0.29	0.25	0.75
QCFO	4,220	0.50	0.50	0.29	0.25	0.75

Table 4
Pearson correlations

This table presents Pearson correlation matrix among the independent variables (N=4,205)

Variables	CFOV	SALEV	OPCYC	NEGE	QPER	QCFO	INVRA	INVRL	INFOPT	INFOPA
SIZE	-0.38***	-0.14***	-0.16***	-0.36***	0.03**	0.06***	0.03**	0.20***	0.13***	0.12***
CFOV		0.36***	0.11***	0.41***	-0.08***	-0.08***	0.07***	-0.03**	0.01	0.17***
SALEV			-0.15***	0.07***	0.01	-0.01	0.08***	0.06***	0.09***	0.25***
OPCYC				0.14***	-0.02	-0.07***	-0.15***	-0.13***	-0.22***	-0.14***
NEGE					-0.10***	-0.15***	0.03**	-0.02	-0.00	-0.05***
QPER						0.47***	0.00	0.00	0.00	0.00
QCFO							-0.00	-0.00	-0.00	-0.00
INVRA								0.52***	0.59***	0.44***
INVRL									0.44***	0.41***
INFOPT										0.44***

*** and ** indicate significance at 1% and 5%, respectively (two-tailed).

Table 5
Country-level analysis

This table presents the standardized coefficients of regressing the returns-earnings association on earnings quality for each country (eq. (6)), and their corresponding t-statistics and two-tailed p-values. Composite score is factor1 score of the factor analysis of anti-director rights, legal enforcement, timeliness of financial disclosure, and analyst coverage.

$$REA_j = \lambda_0 + \lambda_1 QE_j + \lambda_2 SIZE_j + \lambda_3 CFOV_j + \lambda_4 SALEV_j + \lambda_5 OPCYC_j + \lambda_6 NEGE_j + \theta_j . \quad (6)$$

Country	Composite Score	λ_{1QPER}	t-statistic	p-value	λ_{1QCFO}	t-statistic	p-value
AUSTRALIA	0.99	0.200	2.00	0.049	0.058	0.58	0.563
CANADA	1.50	0.304	4.76	0.000	0.132	2.01	0.046
GERMANY	-2.06	-0.161	-1.26	0.212	-0.194	-1.41	0.165
DENMARK	-0.40	0.105	0.52	0.605	-0.277	-1.56	0.132
FRANCE	-0.41	0.157	1.40	0.167	-0.099	-0.84	0.402
UNITED KINGDOM	0.78	0.160	3.65	0.000	0.083	1.85	0.065
HONG KONG	-0.29	-0.094	-0.85	0.382	-0.037	-0.37	0.716
JAPAN	0.73	0.173	5.66	0.000	-0.011	-0.36	0.718
MALAYSIA	-0.46	-0.030	-0.40	0.691	-0.105	-1.39	0.166
NETHERLANDS	-1.16	-0.096	-0.54	0.591	-0.258	-1.43	0.162
SINGAPORE	-0.64	0.044	0.46	0.645	-0.053	-0.55	0.582
THAILAND	0.72	0.175	1.55	0.126	0.225	1.96	0.054
UNITED STATES	0.68	0.224	10.01	0.000	0.126	5.46	0.000

Table 6
Effects of investor rights protection on the association of earnings quality with the value relevance of earnings

This table presents evidence on whether the association between the returns-earnings association and earnings quality is affected by investor rights protection. Columns 3-4 report the results of regressing the returns-earnings association (REA) on earnings persistence (QPER) and the interaction term of earnings persistence and anti-director rights (INVRA) (Specification (4a)). Columns 5-6 report the results of regressing the returns-earnings association on earnings persistence and the interaction term of earnings persistence and legal enforcement (INVRL) (Specification (4b)). Columns 7-8 report the results of regressing the returns-earnings association on the earnings-future cash flows relation (QCFO) and the interaction term of the earnings-future cash flows relation and anti-director rights (Specification (4c)). Columns 9-10 report the results of regressing the returns-earnings association on earnings-future cash flows relation and the interaction term of earnings-future cash flows relation and legal enforcement (Specification (4d)).

$$REA_j = \mu_0 + \mu_1 INVR_j + \mu_2 QE_j + \mu_3 INVR_j * QE_j + \mu_4 SIZE_j + \mu_5 CFOV_j + \mu_6 SALEV_j + \mu_7 OPCYC_j + \mu_8 NEGE_j + \mu_9 INFOPT_j + \omega_j \quad (4)$$

		Specification (4a)		Specification (4b)		Specification (4c)		Specification (4d)	
Variables	Predicted sign	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant		0.542	7.82***	0.442	3.80***	0.695	10.00***	0.587	4.99***
INVRA		0.029	2.61***			-0.035	-3.15***		
INVRL				0.024	2.02**			-0.005	-0.43
QPER		-0.055	-0.69	-0.231	-1.25				
QCFO						-0.275	-3.42***	-0.072	-0.39
INVRA*QPER	+	0.052	2.98***						
INVRA*QCFO	+					0.075	4.20***		

Table 6
(continued)

INVRL*QPER	+			0.044	2.22**				
INVRL*QCFO	+							0.014	0.69
SIZE	-	-0.010	-3.89***	-0.010	-3.92***	-0.011	-4.10***	-0.011	-4.08***
CFOV	+	-0.154	-2.07**	-0.156	-2.10**	-0.178	-2.33***	-0.185	-2.42***
SALEV	+	0.024	0.87	0.025	0.88	0.030	1.06	0.031	1.07
OPCYC	-	0.010	1.57*	0.010	1.58*	0.012	2.01**	0.011	1.85**
NEGE	-	-0.263	-14.62***	-0.264	-14.65***	-0.276	-15.05***	-0.276	-15.01***
INFOPT	+/-	0.000	0.15	0.000	0.27	0.000	0.29	0.000	0.45
N			4,238		4,238		4,220		4,220
F-statistic			53.08***		52.60***		38.36***		36.29***
Adj. R^2			9.96%		9.88%		7.38%		7.00%

***, **, and * indicate significance at 1%, 5%, and 10%, respectively (one-tailed).

Table 7
Effects of information opaqueness on the association of earnings quality with the value relevance of earnings

This table presents evidence on whether the association between the returns-earnings association and earnings quality is affected by information opaqueness. Columns 3-4 report the results of regressing the returns-earnings association (REA) on earnings persistence (QPER) and the interaction term of earnings persistence and timeliness of financial disclosure (INFOPT) (Specification (5a)). Columns 5-6 report the results of regressing the returns-earnings association on earnings persistence and the interaction term of earnings persistence and analyst coverage (INFOPA) (Specification (5b)). Columns 7-8 report the results of regressing the returns-earnings association on earnings-future cash flows relation (QCFO) and the interaction term of the earnings-future cash flows relation and timeliness of financial disclosure (Specification (5c)). Columns 9-10 report the results of regressing the returns-earnings association on the earnings-future cash flows relation and the interaction term of the earnings-future cash flows relation and analyst coverage (Specification (5d)).

$$REA_j = \pi_0 + \pi_1 INFOP_j + \pi_2 QE_j + \pi_3 INFOP_j * QE_j + \pi_4 SIZE_j + \pi_5 CFOV_j + \pi_6 SALEV_j + \pi_7 OPCYC_j + \pi_8 NEGE_j + + \pi_9 INVRA_j + \psi_j \quad (5)$$

		Specification (5a)		Specification (5b)		Specification (5c)		Specification (5d)	
Variables	Predicted sign	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant		0.309	3.51***	0.662	12.86***	0.873	9.89***	0.588	11.23***
INFOPT		0.004	4.30***			-0.004	-3.97***		
INOPA				0.000	0.04			-0.002	-1.78**
QPER		-0.508	-3.82***	0.166	3.32***				
QCFO						-0.624	-4.64***	-0.038	-0.74
INFOPT*QPER	+	0.008	5.20***						
INFOPT*QCFO	+					0.008	5.10***		

Table 7
(continued)

INFOPA*QPER	+			0.001	0.26				
INFOPA*QCFO	+							0.004	1.95**
SIZE	-	-0.010	-3.77***	-0.010	-3.85***	-0.011	-4.09***	-0.011	-3.97***
CFOV	+	-0.149	-2.01**	-0.151	-2.00**	-0.182	-2.38***	-0.184	-2.38***
SALEV	+	0.024	0.87	0.026	0.92	0.032	1.13	0.033	1.14
OPCYC	-	0.010	1.65**	0.009	1.53*	0.012	1.91**	0.011	1.84**
NEGE	-	-0.261	-14.57***	-0.265	-14.71***	-0.273	-14.88***	-0.275	-14.91***
INVRA	+/-	0.002	0.34	0.003	0.60	0.003	0.44	0.005	0.80
N			4,238		4,238		4,220		4,220
F-statistic			55.33***		52.01***		39.35***		36.71***
Adj. R^2			10.35%		9.78%		7.56%		7.08%

***, **, and * indicate significance at 1%, 5%, and 10%, respectively (one-tailed).

Table 8
Effects of investor rights protection and information opaqueness on the association of earnings quality with the value relevance of earnings using a two stage process

This table presents evidence on whether the association between the returns-earnings association and earnings quality is affected by both investor protection (as in Table 5) and information opaqueness (as in Table 6). The second column provides the estimate on the interactive term (which is defined in the first column). The third column provides the adjusted R-square from the regression. FQPER (FQCFO) is the fitted value from the first stage regression where QPER (QCFO) is the dependent variable. The first regression is where QERANK is 0, 1 or 2 based on portfolio rank when sorted by QE:

$$QE_j = \alpha_0 + \alpha_1 SIZE_j + \alpha_2 CFOV_j + \alpha_3 SALEV_j + \alpha_4 OPCYC_j + \alpha_5 NEGE_j + \alpha_6 QERANK_j + \varepsilon_j \quad (7)$$

Description of Interaction Terms	Coefficient	Adjusted R^2 from second stage regression
$INVRA_j*FQPER_j$	0.060***	9.87%
$INVRL_j*FQPER_j$	0.031*	9.70%
$INVRA_j*FQCFO_j$	0.075***	7.28%
$INVRL_j*FQCFO_j$	0.007	6.94%
$INFOPT_j*FQPER_j$	0.008***	10.18%
$INFOPA_j*FQPER_j$	0.000	9.65%
$INFOPT_j*FQCFO_j$	0.007***	7.39%
$INFOPA_j*FQCFO_j$	0.003*	6.98%

*** and ** indicate significance at 1% and 5%, respectively (one-tailed).